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Driven impurity in an ultracold 1D Bose gas with intermediate interaction strength JEAN-SEBASTIEN CAUX, University of Amsterdam, STEVE SIMON, University of Oxford, CLAUDIO CASTELNOVO, University of Cambridge — We study a single impurity driven by a constant force through a 1D Bose gas using a Lieb-Liniger based approach. Our calculation is exact in the interaction amongst the particles in the Bose gas, and is perturbative in the interaction between the gas and the impurity. In contrast to previous studies of this problem, we are able to handle arbitrary interaction strength for the Bose gas. We find very good agreement with recent experiments [Phys. Rev. Lett. 103, 150601 (2009)].

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